

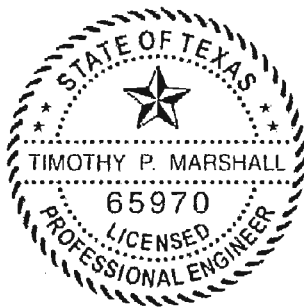
# **EXHIBIT “3”**

This document has been electronically signed and/or sealed in accordance with the applicable State Board of Professional Engineering requirements.

J & J PROPERTIES  
ROOF EVALUATIONS  
4201, 4130, AND 4128 N FIRST  
ABILENE TX 79603  
CENTURY FILE: 0107555  
HAAG FILE: 0111002404-120

CENTURY SURETY INSURANCE COMPANY  
PO BOX 163340  
COLUMBUS OH 43216-3340

ATTENTION: MR BRENDON LEIBROCK



SEPTEMBER 26, 2011

A handwritten signature in cursive script that reads "Timothy P. Marshall".

Timothy P. Marshall  
Sep 28 2011 12:28 PM



4949 West Royal Lane  
Irving, TX 75063  
214-614-6500  
800-527-0168  
Fax 214-614-6501  
[haagengineering.com](http://haagengineering.com)

September 26, 2011

Century Surety Insurance Company  
PO Box 163340  
Columbus, OH 43216-3340

Attention: Mr. Brendon Leibrock

Re: J & J Properties  
Roof Evaluations  
4201, 4130, and 4128 North First  
Abilene, TX 79603  
Century File: 0107555  
Haag File: 0111002404-120

Complying with your request, we inspected the roof coverings at the captioned locations to determine the extent of hail damage, if any. Our inspection was conducted on September 16, 2011.

This engineering report has been written for your sole use and purpose, and only you have the authority to distribute this report to any other person, firm, or corporation. Haag Engineering Co. and its agents and employees do not have and do disclaim any contractual relationship with, or duty or obligation to, any party other than the addressee of this report. Only the engineer(s) who signed this document has the authority to change its contents and then only in writing to you. This report addresses the results of work completed to date. Should additional information become available, we reserve the right to amend, as warranted, any of our conclusions.

#### **DESCRIPTION**

The building at 4128 North First Street was a one-story, steel-framed structure. Exterior walls were clad with painted steel panels, except there was stone masonry along the front of the building which faced south. The building was rectangular in plan with the long dimension oriented north/south. There was a shallow-sloping, gable-type roof covered with painted, galvanized metal R-type panels. Trapezoidal-shaped ribs were spaced 12 inches apart, and the panels were 3 feet wide. Roof panels were secured to the underlying framing with sheet metal screws that had elastomeric washers. Roof appurtenances included lead sleeves on plumbing stacks and galvanized metal exhaust vents.

The building at 4130 North First Street was a one-story structure constructed on a concrete foundation. Exterior walls were clad with stone masonry. The building was oriented east/west;

Century Surety Insurance  
J & J Properties  
Abilene, TX

Page 2  
September 26, 2011  
Haag File: 0111002404-120

the front of the building faced east. There were two roof sections. One roof section was sloping and in the shape of a flying saucer. The other roof section was relatively flat. Both roof sections were covered with built-up membranes that were sandwiched and flooded with asphalt then topped with small gravel. A small curb extended around the east side of the sloping roof and was covered with mineral-coated, modified bituminous membranes, while a combination curb and parapet along the south end of the flat roof was covered with built-up membranes. Roof appurtenances included plastic skylights, soft lead sleeves on plumbing stacks, and steel exhaust vents.

The building at 4201 North First Street was a one-story, strip shopping center constructed on a concrete slab foundation. Exterior walls were brick masonry, painted wood siding, and painted concrete masonry units (CMUs). The building was rectangular in plan with the long dimension oriented east/west; the front of the building faced north. The shallow sloping roof was covered with built-up membranes that were sandwiched and flooded with asphalt then topped with small gravel. A mansard extended across the front of the building and was covered with cedar shakes while the back of the mansard was roofed with three-tab asphalt shingles. Asphalt shingles contained glass-fiber mats that were coated with asphalt and topped with brown granules. Roof appurtenances on the built-up roof included soft lead sleeves on plumbing stacks and 18 air conditioners mounted on landscape timbers or curbs flashed with built-up membranes.

## **BACKGROUND**

We understand a hailstorm occurred on April 24, 2011, and there was question with regard to the extent of hail damage to the roofs. According to the National Weather Service, hail between baseball and softball-size fell in southern portions of the city. Hail up to 4-1/2 inches in diameter was reported at Abilene Mall, 3-1/2 inches in diameter at the airport, and 1-1/2 inches in diameter at Abilene Christian College. These locations were 3, 6, and 4 miles to the south, southeast, and northeast, respectively, from the captioned location.

## **ROOF INSPECTIONS**

Roofs were measured in order to calculate their areas and draw the attached roof plan diagrams. We also compared our measurements to those obtained from EagleView Technologies, Inc. The total roof area of metal roofing at 4128 North First Street was 44 squares. The built-up roof at 4130 North First Street was approximately 80 squares. The built-up roof at 4201 North First Street was 220 squares, with an additional 30 squares of cedar shakes and 25 squares of three-tab asphalt shingles on the mansards.

Century Surety Insurance  
J & J Properties  
Abilene, TX

Page 3  
September 26, 2011  
Haag File: 0111002404-120

#### 4128 NORTH FIRST STREET

The metal roof at this location was in fair condition. The painted (white) surface was worn but there was no evidence of significant rust or other deterioration of the steel. There were a number of empty screw holes in the roof that would allow water entry. In addition, there were no closure strips along the eaves. Thus, we were able to insert a tape measure under the ribs. Water entry could occur if the gutters became full of water as the outside edges of the gutters were higher than the panels. Portions of the east gutter were clogged with leaves. Some foot-caused crimps were noticed in the ribs along the east edge of the roof. The crimps were narrow and deep, extending perpendicular to the panel ribs. Foot-caused crimps were located between underlying purlins. Some of the crimps had been caulked or covered with a panel piece and sealant. Two types of sealants had been applied over certain fasteners. Roof vents were not flashed correctly. There were no gaskets around the vent flanges. (Refer to Photographs 1 through 20.)

Hail had fallen recently at this location as noted by the spatter marks on the metal panels. The spatter marks were created when hail impacted and removed some of the dirt film and paint residue on the panel surfaces. Hail-caused spatter marks measured up to 1 inch in diameter. No hail-caused dents were found in the field panels. However, hail-caused dents were visible in the ridge caps. The dents were broad and shallow compared to the foot-caused crimps. Hail-caused dents measured up to 3/4 inch in diameter and were most visible when looking obliquely at the reflection of the sun or by rubbing the panel surfaces with chalk. The dents were not coincident with the hail-caused spatter marks, indicating these dents were caused by a prior hailstorm(s). (Refer to Photographs 21 through 26.)

#### 4130 NORTH FIRST STREET

The built-up roof at this location was in good condition. The vast majority of the roof was covered with sufficient loose and embedded gravel. No blisters or wrinkles were detected in the membrane. However, there were isolated deficiencies inherent with this roof. Water had accumulated in low spots on the flat roof as well as upslope of curbs on the sloping roof. Roof drains were clogged with leaf debris. There were isolated bare spots in the roof where the asphalt flood coat was exposed to the weather. The exposed asphalt had oxidized and contained craze cracks ("alligatoring"). A white sealant had been applied to three of the plastic skylights. (Refer to Photographs 27 through 32.)

We checked various items for evidence of hailstone impact. No hail-caused bruises or punctures were found in the built-up membranes, even in bare spots. Likewise, no hail damage was found along exposed curbs. Plastic skylights were not cracked or broken by hail. No hail-caused dents were found on the galvanized metal vent caps. (Refer to Photographs 33 through 36.)



Century Surety Insurance  
J & J Properties  
Abilene, TX

Page 4  
September 26, 2011  
Haag File: 0111002404-120

#### 4201 NORTH FIRST STREET

The built-up roof at this location was in good condition. The vast majority of the roof was covered with sufficient loose and embedded gravel. No blisters or wrinkles were detected in the roof membrane. However, condensate from the air conditioners was allowed to drain onto the roof. The control joint in the middle of the roof was not flashed properly and was just covered with a modified bituminous membrane. (Refer to Photographs 37 through 42.)

Cedar shakes on the mansard were in a deteriorated condition. There were a number of weathered splits in the wood. Recent insert repairs had been done to the mansard using low grade wood that contained knots. The inserted shakes were not weathered, indicating the repairs were performed recently. Asphalt shingles were in good condition with little evidence of weathering or embrittlement. However, some shingle slippage was noted. Close examination revealed the shingles were not nailed or sealed correctly for being on such a steep slope. Vertical tears were noted where shingles had slid downslope. (Refer to Photographs 43 through 50.)

We checked various appurtenances looking for evidence of hailstone impact. Hail-caused spatter marks were visible on the air conditioner cabinets. The marks were caused when hail impacted and removed some of the oxidation on the painted metal cabinets. Hail-caused spatter marks measured up to 3/4 inch in diameter on the tops of the units with smaller sized spatter marks on the north, west, and south sides of the units. Hail-caused dents up to 3/4 inch in diameter were measured in the exposed, south-facing, aluminum fins on three Lennox air conditioners. The nameplates on the Lennox units were worn so we were unable to determine the dates the units were manufactured. Rheem air conditioners had dates of manufacture ranging from September 1999 through October 2010. Fins were protected by louvers on these units. (Refer to Photographs 51 through 56.)

Examination of the built-up roof revealed no hail-caused bruises, punctures or spalled areas in the roof surface. Even exposed areas of the built-up membranes along curbs and parapets were notably absent of hail-caused damage. Likewise, no hail-caused bruises were found in the three-tab asphalt shingles on the back side of the mansard or to the modified bituminous membrane on the expansion joint. No hail-caused splits were found in the cedar shake mansard. (Refer to Photographs 57 through 64.)

#### **DISCUSSION**

Hail had fallen recently at the captioned locations as noted by the spatter marks on various metal surfaces. The spatter marks measured up to 3/4 inch in diameter. The spatter marks were not damaging to the metal surfaces and will fade with time. No hail damage was found to the roof coverings from the involved storm. No hail-caused fractures or open seams were found on the metal roof at the 4128 North First Street location. Hail-caused dents in the ridge cap were old as

Century Surety Insurance  
J & J Properties  
Abilene, TX

Page 5  
September 26, 2011  
Haag File: 0111002404-120

they were not coincident with the spatter marks on the panels. No hail-caused bruises, punctures, or spalled areas were found to the built-up roofs at the 4130 and 4201 North First Street locations. Likewise, the cedar shake mansard and three-tab shingles in back of the mansard did not exhibit any hail-caused damage. Additional dents could have occurred to the exposed aluminum fins on three Lennox air conditioners; the dented fins can be combed.

Functional hail-caused damage can occur to the metal panels if the hail is large and hard enough to crack or penetrate the metal panels, open up seams, or unseat fasteners. Generally, only the largest hail can do such damage. Hail-caused dents in the panels, without cracking or penetrating the panels, are cosmetic at worst. The hail dents will not promote or accelerate rust.

Metal panels initially were formed from flat sheets (coil stock) that were rolled through a series of dies that bent the metal into the desired profile. Such bending or denting of the metal actually increased panel strength. The radius of curvature in forming the panel ribs was more severe than the old hail-caused dents found to the ridge caps at the 4128 North First Street location. Also, foot-caused crimps in the panel ribs were more severe than the hail-caused dents.

Commercial roof panels must pass a series of rigorous tests in order to be approved for mass production. One of these tests is Factory Mutual (FM) 4471 which is an impact test for metal panels. The test involves dropping steel balls either, 1-3/4 or 2-1/4 inches in diameter, from certain heights. A minimum of 10 impacts is required. The metal roof panel must not be punctured, and the coating shall not show any signs of chipping, peeling, cracking or crazing when examined less than 10-power magnification. Dented panels will pass this test. The test is available at: <http://www.fmglobal.com/assets/pdf/fmapprovals/4471.pdf>.

For hailstones to damage built-up roofing, the hailstones must be large enough and have sufficient density and impact velocity to break or spall the asphalt flood coat and fracture or penetrate the roofing membrane. The damaged area usually appears as a round area of glossy black asphalt. Usually, pieces of felt and flood coat are scattered about the impact point. These observations are based on controlled impact studies on built-up roofs as well as our personal experience in assessing hail damage to built-up roofing membranes. Hail damage is not hidden, in that if it is present, it can be found at the weathering surface.

Exposed areas of the roof (i.e., parapets and curbs) would be more susceptible to hail damage than field areas where it is protected by gravel. The loose and imbedded gravel as well as the flood coat provides significant protection to the roof membrane from hail-caused impact. The asphalt flood coat and gravel serve to dissipate the energy of impacting hailstones. Thus, a built-up roof covered by gravel is safe from all but the largest of hailstones. Impact tests have shown that built-up roofs can withstand damage from large hail. Gravel is not driven into the membrane but scattered outward from the impact point. No such hail damage was found to the built-up roofs.

Century Surety Insurance  
J & J Properties  
Abilene, TX

Page 6  
September 26, 2011  
Haag File: 0111002404-120

There were a number of inherent deficiencies with each roof. Empty fastener holes were found on the metal roof at the 4128 North First Street location, and there were no closure strips along the eaves. The built-up roof at the 4130 North First Street location accumulated water and roof drains were clogged with leaf debris. Condensate was allowed to drain onto the roof at the 4201 North First Street location, and the expansion joint was not flashed correctly. In addition, the three-tab shingles in back of the mansard were not installed correctly, leading to occasional shingle slippage/displacement.

### **CONCLUSIONS**

Based on our analysis and inspection of the roof coverings at the captioned locations, we have reached the following conclusions:

1. Hail had fallen recently at this location as noted by the spatter marks on various roof items. Individual spatter marks measured up to 3/4 inch in diameter.
2. There was no hail damage from the involved storm to the metal roof at 4128 North First Street.
3. There was no hail damage to the built-up roofs at the 4130 or 4201 North First Street locations.
4. There was no hail damage to the cedar shakes or three-tab shingles on the mansard at the 4201 North First Street location.
5. Additional hail-caused dents could have occurred to the exposed aluminum fins on three Lennox air conditioners at the 4201 North First Street location. The dented fins can be combed.



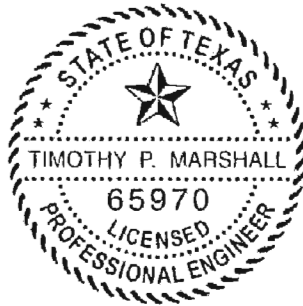
Century Surety Insurance  
J & J Properties  
Abilene, TX

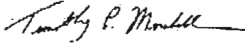
Page 7  
September 26, 2011  
Haag File: 0111002404-120

6. There were a number of inherent deficiencies with each roof as summarized within this report.

Respectfully submitted,

**HAAG ENGINEERING CO.**



 Timothy P. Marshall  
Sep 28 2011 12:30 PM

Timothy P. Marshall, P.E.  
Texas License 65970  
Meteorologist

Haag Engineering Co.  
CA F-311  
Expires: 06/30/12

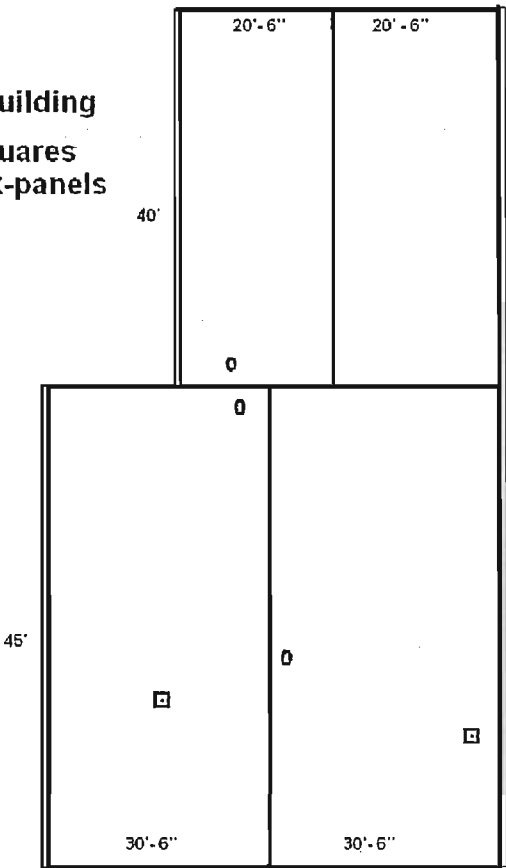
TPM:gjg

*Attachments*

**HAAG**

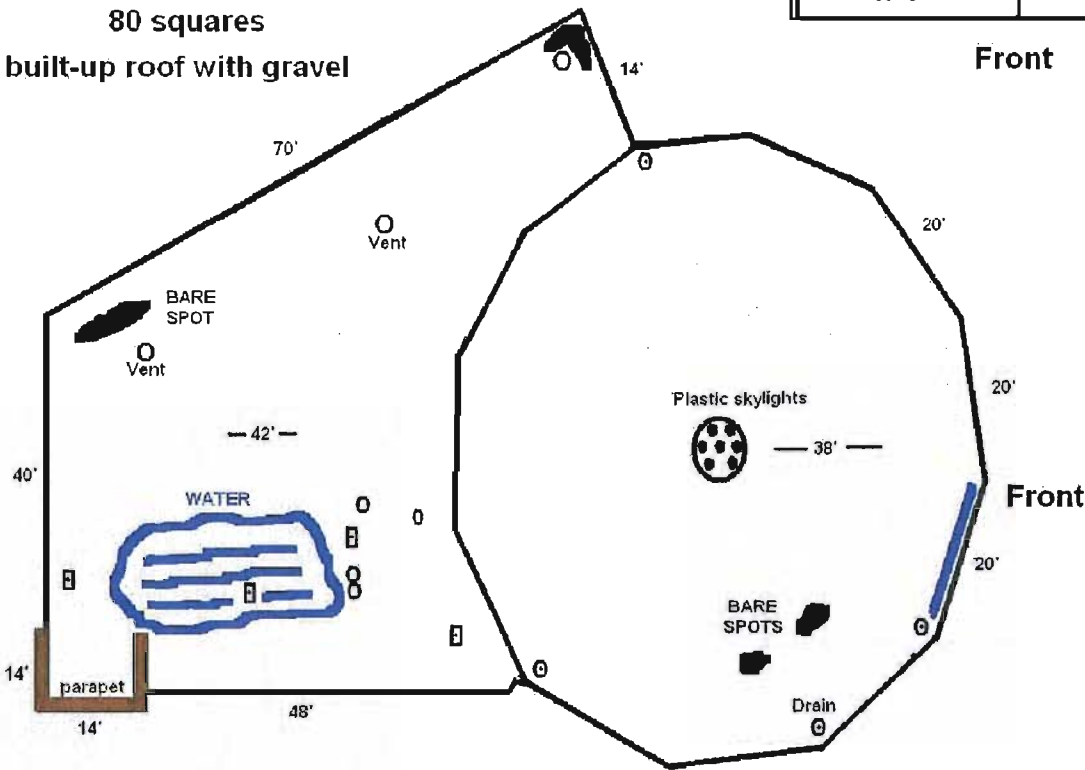
# *J and J Properties Roof Plans*

4128 building  
44 squares  
metal R-panels



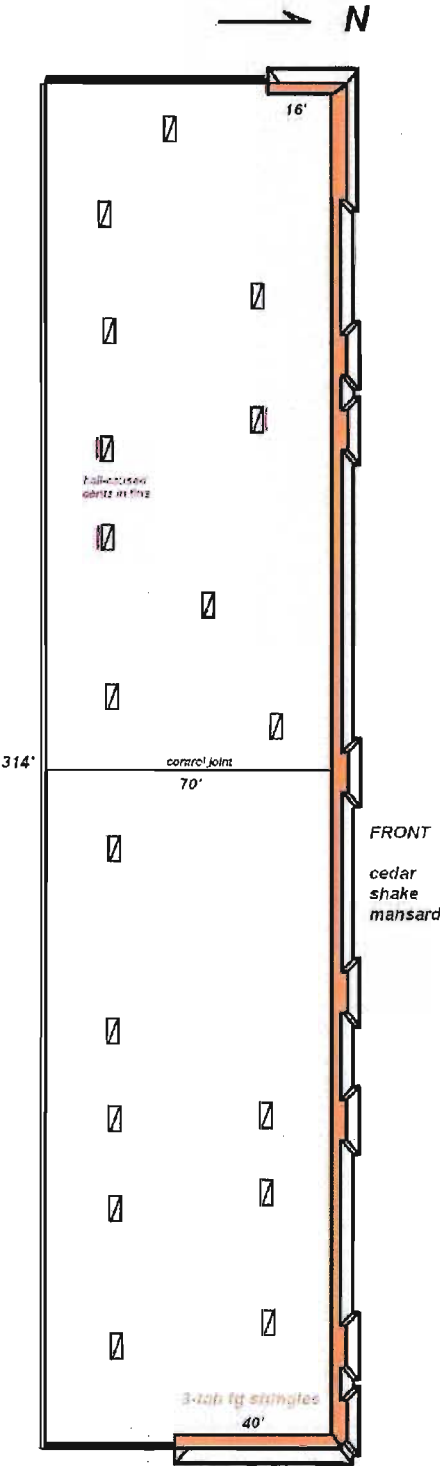
Front

4130 building  
80 squares  
built-up roof with gravel



# ***J and J PROPERTIES ROOF PLAN***

4201 N. First St.



220 squares - built-up gravel  
25 squares - 3 tab ty shingles  
30 squares - cedar shakes

*Photographs*

**HAAG**

*Photographs*



J & J Properties  
Abilene, TX  
0111002404-120



1. 4128 BLDG – Front elevation view of building.



2. 4128 BLDG – West roof slope looking north.

J & J Properties  
Abilene, TX  
0111002404-120



3. 4128 BLDG – East roof slope looking north.



4. 4128 BLDG – Roof was covered with R-type metal panels.



J & J Properties  
Abilene, TX  
0111002404-120



5. 4128 BLDG – Empty fastener holes in panels.

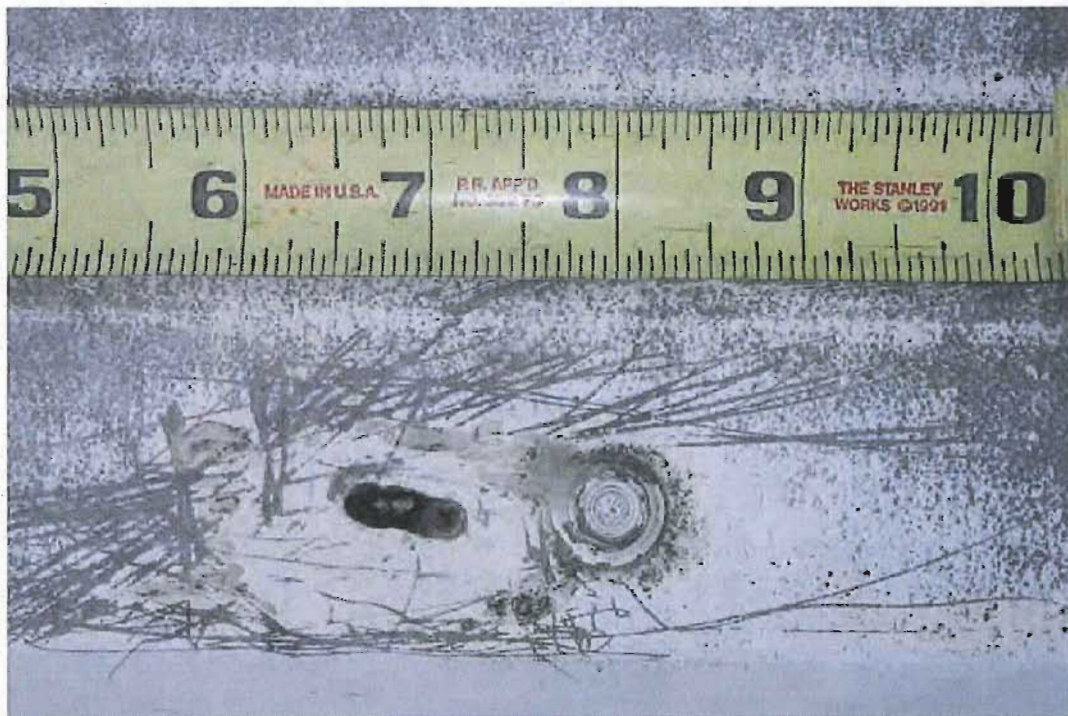


6. 4128 BLDG – Another empty fastener hole in panel.

J & J Properties  
Abilene, TX  
0111002404-120



7. 4128 BLDG – Empty fastener holes in panels.



8. 4128 BLDG – Another hole in a panel.



J & J Properties  
Abilene, TX  
0111002404-120



9. 4128 BLDG – Lack of eave closure.



10. 4128 BLDG – Clogged gutter.



J & J Properties  
Abilene, TX  
0111002404-120



11. 4128 BLDG – Foot-caused crimps in panel ribs.



12. 4128 BLDG – Caulk applied to crimped rib.

J & J Properties  
Abilene, TX  
0111002404-120



13. 4128 BLDG – Crimped panel rib due to foot traffic.



14. 4128 BLDG – Repaired rib.



J & J Properties  
Abilene, TX  
0111002404-120



15. 4128 BLDG – Sealant applied to fasteners.



16. 4128 BLDG – Caulking applied to fasteners.

J & J Properties  
Abilene, TX  
0111002404-120



17. 4128 BLDG – Base flashing was not sealed correctly around vent.



18. 4128 BLDG – Base flashing was not sealed correctly around vent.



J & J Properties  
Abilene, TX  
0111002404-120



19. 4128 BLDG – Lead sleeve was not flashed correctly.



20. 4128 BLDG – Lead sleeve was not flashed correctly.



J & J Properties  
Abilene, TX  
0111002404-120



21. 4128 BLDG – Hail-caused spatter marks on panels.



22. 4128 BLDG – Closer view of hail-caused spatter marks on panel.

J & J Properties  
Abilene, TX  
0111002404-120



23. 4128 BLDG – Oblique view showing hail-caused spatter marks on panels.



24. 4128 BLDG – Hail-caused dents in ridge cap.



J & J Properties  
Abilene, TX  
0111002404-120



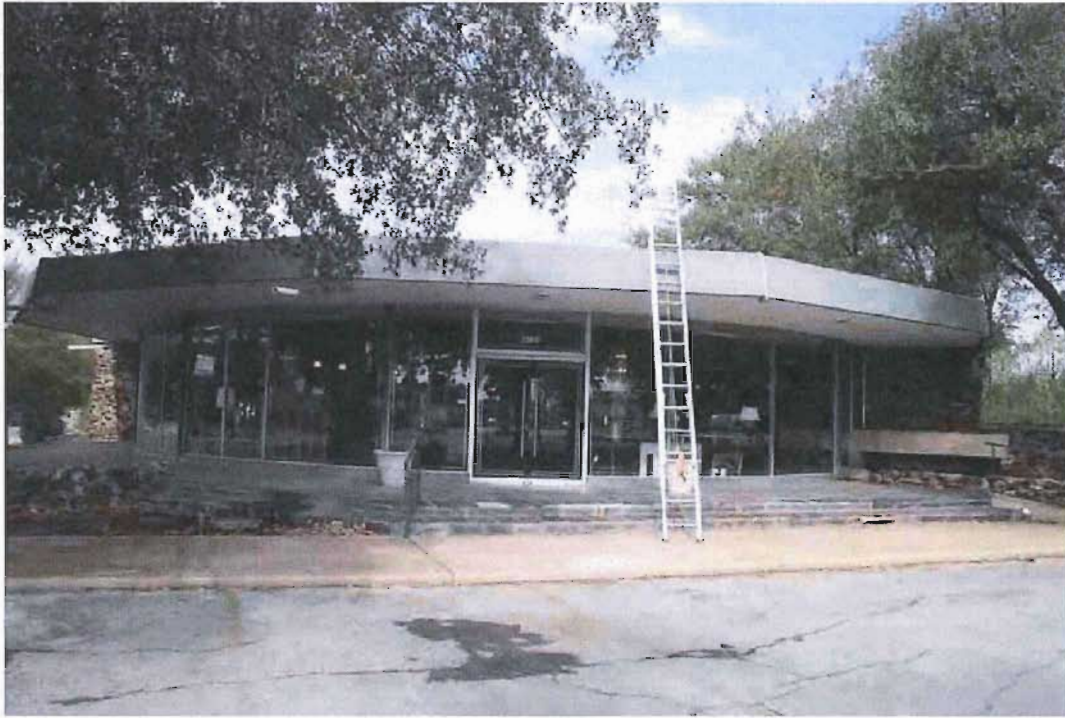
25. 4128 BLDG – Chalk rub on east panel revealed no hail-caused dents.



26. 4128 BLDG – Chalk rub on west panel revealed no hail-caused dents.



J & J Properties  
Abilene, TX  
0111002404-120



27. 4130 BLDG – Front (east) elevation view of building.



28. 4130 BLDG – Roof view of sloping section.



J & J Properties  
Abilene, TX  
0111002404-120



29. 4130 BLDG – View of gravel surface.



30. 4130 BLDG – Flat roof. Note ponded water.



J & J Properties  
Abilene, TX  
0111002404-120



31. 4130 BLDG – Clogged roof drain.



32. 4130 BLDG – Bare roof membrane.



J & J Properties  
Abilene, TX  
0111002404-120



33. 4130 BLDG – Lack of hail damage to exposed curb.



34. 4130 BLDG – Lack of hail damage to plastic skylights.



J & J Properties  
Abilene, TX  
0111002404-120



35. 4130 BLDG – No hail-caused dents in galvanized metal vents.



36. 4130 BLDG – Closer view of galvanized metal vent.



J & J Properties  
Abilene, TX  
0111002404-120



37. 4201 BLDG – Front (north) elevation view of building.



38. 4201 BLDG – Roof view looking west from southeast corner.



J & J Properties  
Abilene, TX  
0111002404-120



39. 4201 BLDG - Roof view looking north from southeast corner.



40. 4201 BLDG - View of gravel surface.



J & J Properties  
Abilene, TX  
0111002404-120



41. 4201 BLDG – Condensate from air conditioner drains onto roof.



42. 4201 BLDG – Improperly flashed expansion joint.



J & J Properties  
Abilene, TX  
0111002404-120



43. 4201 BLDG – Front of mansard was covered with cedar shakes.



44. 4201 BLDG – Recent repairs to mansard.



J & J Properties  
Abilene, TX  
0111002404-120



45. 4201 BLDG – Shim repairs on mansard.



46. 4201 BLDG – Slippage of some shingles on back of mansard due to improper fastening.



J & J Properties  
Abilene, TX  
0111002404-120



47. 4201 BLDG – Old missing shingle. Note rusted nails.



48. 4201 BLDG – Shingle slid downslope.



J & J Properties  
Abilene, TX  
0111002404-120



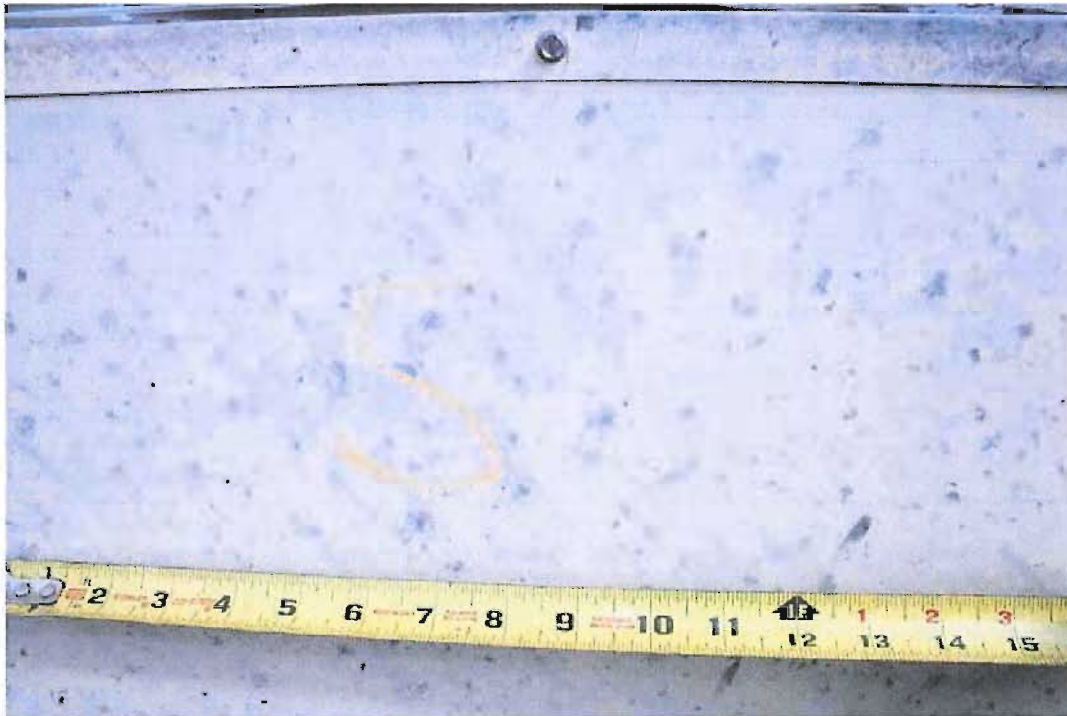
49. 4201 BLDG – Another shingle slid downslope.



50. 4201 BLDG – Vertical tear (right) beneath fastener.



J & J Properties  
Abilene, TX  
0111002404-120



51. 4201 BLDG – Hail-caused spatter marks on south side of metal air conditioner cabinet.



52. 4201 BLDG – Hail-caused spatter marks on east side of metal air conditioner cabinet.



J & J Properties  
Abilene, TX  
0111002404-120

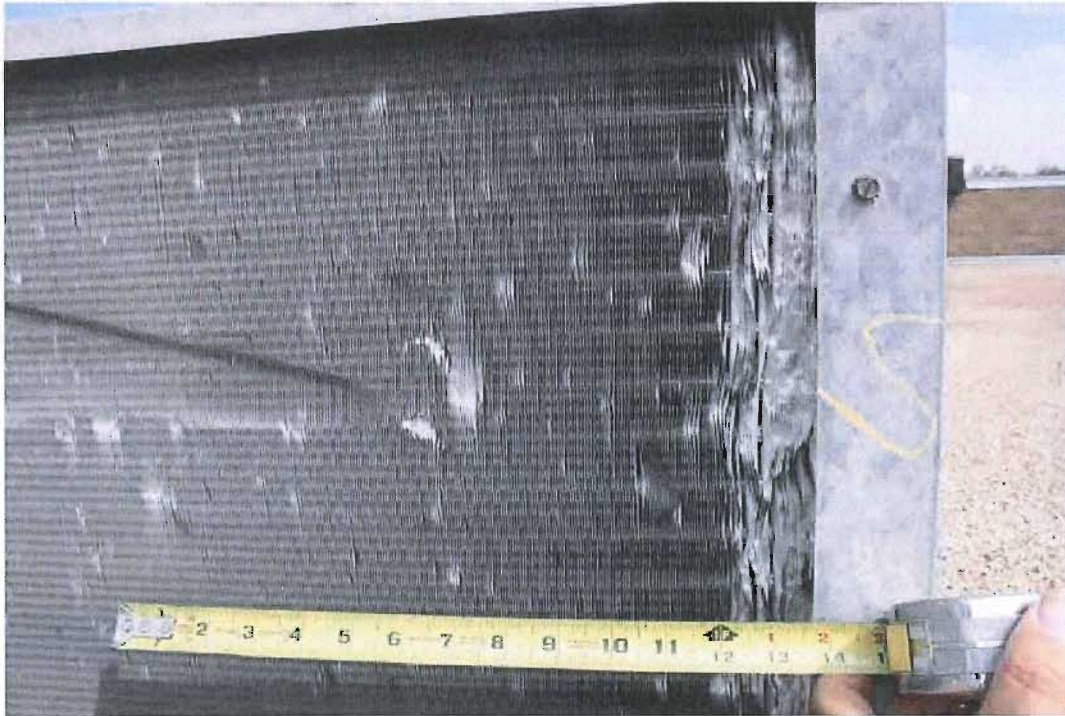


53. 4201 BLDG – Close-up view of largest spatter mark found on top of metal air conditioner cabinet.



54. 4201 BLDG – Hail-caused dents in north facing fins on air conditioner.

J & J Properties  
Abilene, TX  
0111002404-120



55. 4201 BLDG – Hail-caused dents in south facing fins on air conditioner.



56. 4201 BLDG – Hail-caused dents in south facing fins on air conditioner.



J & J Properties  
Abilene, TX  
0111002404-120



57. 4201 BLDG – Lack of hail-caused damage to built-up roof.



58. 4201 BLDG – Lack of hail damage to west facing parapet flashing.



J & J Properties  
Abilene, TX  
0111002404-120



59. 4201 BLDG – Lack of hail damage to east facing parapet flashing.



60. 4201 BLDG – Lack of hail damage to curb flashing around air conditioners.



J & J Properties  
Abilene, TX  
0111002404-120



61. 4201 BLDG – Lack of hail damage to modified bituminous membrane on expansion joint.



62. 4201 BLDG – Lack of hail damage to asphalt shingles, south slope.

J & J Properties  
Abilene, TX  
0111002404-120



63. 4201 BLDG – Lack of hail damage to asphalt shingles, east slope.



64. 4201 BLDG – Lack of hail damage to asphalt shingles, west slope.



# **EXHIBIT “A”**

## **2013 RESUME**

**Timothy P. Marshall, P.E./Meteorologist**

**Haag Engineering Co.**

4949 W. Royal Lane

Irving, Texas 75063

Phone: 214-614-6500

### **EDUCATION**

M.S. Civil Engineering, Texas Tech University, 1983.

M.S. Atmospheric Science, Texas Tech University, 1980.

B.S. Meteorology, Northern Illinois University, 1978.

### **EXPERIENCE**

Engineer, Haag Engineering Co., Dallas, Texas, since 1983.

Research Asst., Institute for Disaster Research, 1981-1982.

Research Asst., Atmospheric Science, 1979-1980.

Teaching Asst., Atmospheric Science, 1978-1979.

Channel 6 TV Meteorologist, Dekalb, Illinois, 1976-1977.

### **PROFESSIONAL LICENSES**

Registered Professional Engineer, 1989.

### **PROFESSIONAL MEMBERSHIPS AND ACTIVITIES**

American Meteorological Society, since 1974.

National Weather Association, since 1977.

American Society of Civil Engineers, since 1981.

Roofing Industry Committee on Weather Issues, 2009.

### **HONORS**

Civil Engineering Excellence Award, 2002.

Civil Engineering Academy, Texas Tech University, Inducted 2002.

### **COMMITTEES**

Roof Ad Hoc Committee, 1985

Severe Thunderstorm Warning Committee, 2000

NOAA/NWS Quick Response Team, 2003 through current

Enhanced Fujita Scale Committee, 2003 through current

Severe Local Storms Committee, American Meteorological Society, term: 2006 through 2011.

Consultant to the Saffir-Simpson Hurricane Scale Committee

### **RECENT LECTURES**

Wind versus Wave Damage

Hail Impact Testing on Roofing Products

Wind Effects on Structures

Wind Effects on Roofs

Tornado Damage Surveys

Mechanical Damage to Roofs and Vehicles

Wood Roofs Damage Assessment

Composition Roofs Damage Assessment

Built-up Roofing Damage Assessment

Tile Roofing Damage Assessment

Inspection and Evaluation of Residential Roofing

Metal Roof Damage Assessment

Residential Framing

Exterior Insulation Finishing Systems

Roof Area Calculations

Hurricane Ike, Hurricane Katrina

The Enhanced Fujita Scale

Tornado/Hurricane Shelters